3.0 Technical Plan

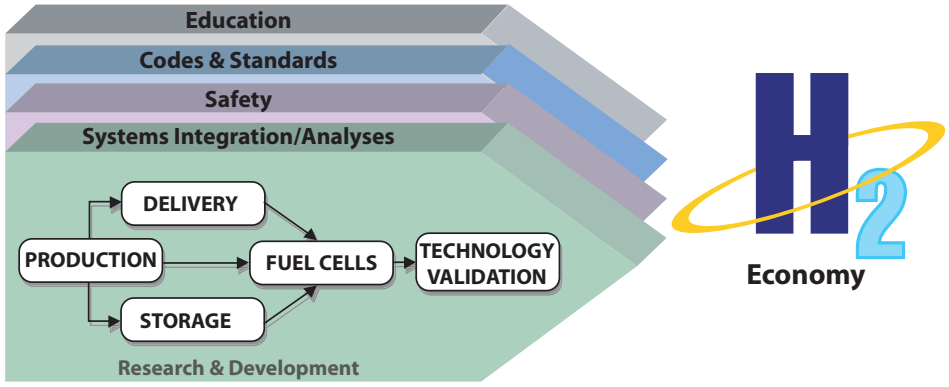
This section of the Plan provides a detailed outline of the various activities occurring within the eight program elements of the Hydrogen, Fuel Cells & Infrastructure Technologies Program, as follows:

3.1 Hydrogen Production
3.2 Hydrogen Delivery
3.3 Hydrogen Storage
3.4 Fuel Cells
3.5 Technology Validation
3.6 Hydrogen Codes and Standards
3.7 Hydrogen Safety
3.8 Education

For each section, a brief introduction is followed by the specific goal and objectives of the program element. The remainder of the section presents the program element's strategy for achieving success and measuring progress. This begins with an overview of the technical approach and review of the current activities within the program element. Next, each section lays out specific targets that will lead a pathway toward the program element objectives, barriers that the program element faces to achieving these targets, and then the specific tasks and milestones that the program element will use to direct their efforts and gauge their progress.

Activities within each of the program elements must be coordinated and integrated to achieve the ultimate commercialization goals of the Program. Interrelationships between program elements are represented in Figure 3.0.1; specific inputs and outputs between program elements are identified in the milestone charts and tables. Systems integration will be used to identify, analyze, and evaluate these complex interdependencies and to guide decision making for the Hydrogen, Fuel Cells & Infrastructure Technologies Program Managers. The program management and systems integration functions are discussed in Section 4.0.

Figure 3.0.1. Hydrogen, Fuel Cells & Infrastructure Technologies Program



Each program element is also actively involved in coordination activities with other Programs within the DOE Office of Energy Efficiency and Renewable Energy (EERE). In particular, programs that perform research on technologies that can be used to produce or use hydrogen

are an important component of research taking place within the Hydrogen, Fuel Cells & Infrastructure Technologies Program. These include:

- Wind and Hydropower Technologies Program,
- Geothermal Technologies Program
- Solar Energy Technology Program
- Biomass Program
- Freedom Car and Vehicle Technologies Program
- Building Technologies Program
- Federal Energy Management Program

Each of these programs is pursuing technologies that will efficiently and affordably enhance the nation's access to clean, domestic energy supplies. Hydrogen can play a key role in the realization of these technologies, and will certainly benefit from the research and development taking place in each program. Advanced electrolysis technologies, conversion of biomass to hydrogen, PEM fuel cell development, and application of hydrogen for stationary energy needs are examples of areas in which collaboration between the Hydrogen, Fuel Cells & Infrastructure Technologies Program and other EERE Programs is vital to the technical targets identified in this chapter.

Note: Throughout this section, hydrogen cost targets are given in units of $/kg. For comparison, one kilogram of hydrogen has approximately the same energy content as a gallon of gasoline, on a lower heating value basis